Model 227
Ultra-High Purity Pressure Transducer

Features
- Variable capacitance technology
- High resolution & longterm stability
- Small cavity, efficient purge cycles
- Semi F19/F20 compliant 316L VIM/VAR wetted materials
- EMI/RFI immunity prevents false shutdown
- Optimal non-incendive approval for use in potentially hazardous locations available for 4-20mA output units
- CE & RoHS compliant

Applications
- Modular 1-1/8” surface mount gas sticks and panels
- High purity gas delivery systems
- Semiconductor process tools

Setra's Model 227 transducer is designed for high density, surface mount gas sticks and panels, required for today's 300 mm tools. The Mode 227's 1-1/8” footprint optimizes valuable space, and its rugged design makes it ideal for pressure measurements that require long-term stability, high accuracy and exceptional insensitivity to environmental extremes.

316L VIM/VAR stainless steel wetted materials
Unlike many other designs with large dead-ended cavity volume, the 227 has a small swept sensor chamber for easy purgeability. All wetted parts are 316L VIM/VAR stainless steel passivated to 5 Ra (7 Ra. max) finish, which eliminates surface irregularities and provides the proper surface chemistry for corrosion resistance, assuring contaminant-free gas distribution.

Versatile configuration options
Available with 5 VDC, 10 VDC, or 4 to 20mA output, the Model 227 offers +/-0.25% Full Scale or 1.0% of Reading accuracy. The Model 227 comes with an industry standard 1-1/8” C-Seal surface mount base with choice of a multiconductor cable, 4-pin bayonet connector, and 9 or 15 pin D-sub connector for electrical termination. When coupled with the Model 328 1-1/8” rotatable display, this package provides the ultimate in pressure measurement and local readout.

Side access to the zero and span adjustments beneath the rotating protective cover, and choice of absolute, gauge or compound pressure ranges complete this unique design.

Principle of operation
Setra's patented variable capacitance sensor features a 316L stainless steel diaphragm and an insulated electrode plate. A variable capacitor is formed between the sensor body and the electrode plate. An increase in pressure causes a slight rounding of the diaphragm, which decreases the capacitance. The capacitance change is detected and converted to a highly accurate linear DC electric signal by Setra's unique custom integrated circuit, utilizing a patented charge balance principle.

Setra's entire ultra-high purity series is based on Setra's proven capacitive sensing technology with highly accurate and stable voltage or current output signals that are virtually EMI/RFI immune.
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Specifications

Performance data

Accuracy RSS\(^1\) (at constant temp) \(\pm 1.0\%\) Reading; \(\pm 0.25\%\ FS\)
Non-linearity, BFSL \(\pm 0.15\%\ FS\)
Hysteresis \(0.20\%\ FS\)
Non-repeatability \(0.02\%\ FS\)
Thermal effects\(^2\)

<table>
<thead>
<tr>
<th>Compensated range °F(°C)</th>
<th>+15 to +150 (-9 to +65)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zero/Span Shift %FS/100°F(°C)</td>
<td>2.0 (1.8)</td>
</tr>
</tbody>
</table>

Environmental data

Operating/storage\(^3\) temperature °F (°C) -40 to +185 (-40 to +85)

Current unit ordered w/ option “N1”

Operating limit °F (°C) -22 to +176 (-30 to +80)

Pressure media

Liquid or gases compatible with 316L stainless steel.

Approvals

Non-incendive: Certified for use in potentially hazardous locations:
North America: Optional listed to ANSI/ISA - 12.2.2011 standards for Class 1, Division 2, Group A,B,C,D Hazardous Locations

ATEX 94/9/EC Zone 2 Approval to EN60079-0:2012 and EN60079-15:2010 II 3G Ex nA IIC Gc -30°C<Ta<+80°C

Specifications subject to change without notice.

Physical description

Electrical connection 6ft. multiconductor cable, bayonet, connector or D-SUB connector
Case Stainless steel
Pressure fitting Down mount “C” seal
Vent Through zero/span access holes
Weight 6.5 oz (184g)

Electrical data (voltage)

Excitation 10 to 30 VDC for 5V FSO
13 to 30 VDC for 10V FSO
Circuit 3-Wire (Exc, Out, Com)
Current consumption <8mA
Output\(^4\) 0 to 5 VDC or 0.2 to 5.2VDC\(^5\)
0 to 10VDC or 0.2 to 10.2VDC\(^5\)

Electrical Data (Current)

Circuit 2-Wire
Output\(^4\) 4 to 20mA\(^7\)
External load 0 to 800 ohms
Maximum supply voltage (VDC) 30 + 0.04 x (Resistance of receiver plus line)
Minimum supply voltage (VDC) 10 + 0.02 x (Resistance of receiver plus line)

Overpressure capability

<table>
<thead>
<tr>
<th>Full scale range (or equivalent)</th>
<th>Minimum proof pressure PSIG</th>
<th>Design pressure PSIG</th>
<th>Minimum burst pressure PSIG</th>
</tr>
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<tbody>
<tr>
<td>25</td>
<td>40</td>
<td>180</td>
<td>1500</td>
</tr>
<tr>
<td>50</td>
<td>75</td>
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<td>7500</td>
</tr>
<tr>
<td>3000</td>
<td>3500</td>
<td>3000</td>
<td>10,000</td>
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</table>

Design Pressure calculated per ASME BPVC IV-2015 HG-502.3

Proof Pressure: The maximum pressure that may be applied without changing performance beyond specifications (±1% FS zero shift).
Burst Pressure: The maximum pressure that may be applied to the positive pressure port without rupturing the sensing element.

\(^1\)RSS of Non-Linearity, Non-Repeatability, and Hysteresis
\(^2\)Units calibrated at nominal 70°F. Maximum thermal error computed from this datum.
\(^3\)Operating temperature limits of the electronics only. Pressure media temperatures may be considerably higher or lower.
\(^4\)Calibrated into a 50K ohm load, operable into a 5000 ohm load or greater.
\(^5\)Zero output factory set to within ±0.08 mA. Span (Full Scale) output factory set to within ±0.08 mA.
Ordering information

Example part number: 227G100PGE511D1F;
227 Transducer, 0 to 100 PSIG, Down Mount "C" Seal Flange, 4-20mA Output, 15 pin D-sub Connector and ±0.25% FS Accuracy:

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<thead>
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<tbody>
<tr>
<td>Model</td>
<td>Pressure ranges</td>
<td>Pressure type</td>
<td>Pressure fitting</td>
<td>Output</td>
<td>Electrical termination</td>
<td>Accuracy</td>
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<tr>
<td>227G</td>
<td>025P</td>
<td>0 to 25 PSI</td>
<td>A Absolute</td>
<td>E5 Down mount &quot;C&quot; seal (1.125&quot; Base)</td>
<td>11 4-20mA</td>
<td>06 6ft. multiconductor cable</td>
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<tr>
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<td>050P</td>
<td>0 to 50 PSI</td>
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<td>C Compound</td>
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<td>B1 4 pin bayonet connector</td>
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<td>G Gauge</td>
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</tbody>
</table>

1 Absolute ranges only. Only available with pressure type code “A”.
2 Compound ranges only. Only available with pressure type code “C”.
3 With Hazardous Location Approvals
4 Not Available with N1 Output Option

Dimensions

Electrical termination Code “B1”

Electrical termination Code “D1”

Pressure fitting Code “E5”

[mm] in.